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DRAFT NOTES--Not for Circulation Without Permission
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The X-Ray Laser and Automated Launch-on-Warning

In order to have line-of-sight access to attack Soviet missiles while they are still in their brief boost phase--without being constantly in orbit over the Soviet Union, which would make them continuously vulnerable--the XRLs are to be "popped up" by rockets launched from submarines near the borders of the Soviet Union, on the basis of warning from U.S. infrared satellites of a multiple missile launch. If the XRLs are to achieve sufficient altitude to attack (allowing for the earth's curvature) within the few minutes available before the booster rockets burn out (the system needs the burning plume for tracking and aiming) they must be launched within a minute or so after detecting of the missile launch.

This requirement precludes any human decision-making or operational involvement. The warning signal must be sent directly to the submarine--perhaps by blue-green laser from the satellite--and the launchers boosting the XRL devices (a thermonuclear explosive device, lasing rods and pointing and tracking devices) into space must respond to the signal automatically and instantaneously.

It is admitted by proponents of SDI, and the XRL component specifically, that such a system is susceptible to false alarms. Infrared systems have already in the past generated false alarms of mass Soviet missile attacks: e.g., based on forest fires or oil line fires, or false positives from sunlight. This possibility cannot be eliminated. And any proposal for automated responses to infrared or electronic warning raises questions of the acceptability of the consequences of acting upon a false alarm. If the automated action is to launch offensive missiles, the "cost" is obviously the mistaken initiation of World War III. But the proponents of boost-phase intercept, and the pop-up mode, assert that the risks of mistaken activation are acceptable, because if there was in fact no Soviet missile launch, the XRLs would simply be directing their lightning-bolts at phantoms, not at ground targets. Nothing would be damaged; there would be no need or incentive for the Soviets to respond. The only consequence of a false alarm, in the words of one official (in Newsweek) would be "snap, crackle and pop" in outer space. This is fortunate for the viability of the pop-up concept, since it absolutely requires automated launch-on-warning for its feasibility.

However, some problems emerge when one considers this system in a larger context, including its role as one component in an overall "damage-limiting" mission, and its interaction with Soviet warning and response systems. Suppose that a false alarm occurs, leading to an automated response by U.S. boost-phase defenses, including pop-up launch of XRL's. The following four questions

seem virtually to answer themselves, most ominously, once they are raised (which I have not seen elsewhere).

1. How will the Soviets respond to signals from their warning satellites that multiple launches of missiles from submarines around their borders are taking place?

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To belabor the point: How will they interpret this information? Would they have any basis for distinguishing this from the launching of offensive missiles? Will the Soviet warning systems be capable, reliably, of recognizing even such indications as might be detected by more sophisticated systems?¹ And would they care? U.S. offensive missiles might be disguising themselves; and anyway, a preemptive U.S. attack could begin with the launch of space-based satellites intended to attack Soviet retaliatory launches and command and control. How long would the Soviets wait, before responding to this signal, to see whether the launches were "merely" a false alarm of the XRL systems?

2. In the event of infrared warning of a massive SU launch (which, I am supposing, might be a false alarm) would the U.S. submarines or other close-in bases for XRLs hold back some of their ready XRLs in reserve, or would they launch all that were ready to go? Given the need for speedy attack and for maximum effectiveness in the boost phase intercept, and the probable limitations on early raid analysis, it is hard to believe that any, or many, ready defensive systems would be held back. But this would mean that a false alarm would disarm the U.S. of its boost-phase capabilities, at least for some period. This could be a rather dangerous period for the U.S., given the above consideration. (Perhaps one could imagine a "self-fulfilling prophecy" situation in which the U.S. false alarm triggers a Soviet offensive response in time to provide the XRLs with real targets to destroy, instead of the phantoms that occasioned their launch. But if the Soviet response was less efficient and prompt...)

¹ I asked Pike of FAS: Do the Soviets have an infrared warning satellite comparable to ours? He said: They do have an infrared warning system, though they are thought to be about ten years behind us in this technology. According to "unclassified folklore," their sensors are less sensitive, more subject to false alarms, with less ability to track. Thus, it is harder for them to count or track separate plumes. Their system is suited for early warning, but not raid analysis. All this strengthens my point. It makes it even less likely than otherwise that they could discriminate between the launch of pop-up x-ray lasers (XRL's) and the launch of offensive missiles.

3. If the warning of Soviet attack is convincing and ominous enough to occasion the expenditure of all ready pop-up XRLs, would it not--should it not, must it not--lead to the use of XRLs, both from space and ground-based, against Soviet satellites for command and control, communications and warning, and space-based defense systems, as well as against the phantoms that were associated with the false alarm? I.e., in addition to the snap, crackle and pop against insubstantial shadows, would not the pop-up systems also be targeted against very substantial, and critical, Soviet systems? Whether XRLs would hit supposed rising boosters, real or not, in time, and whether they would destroy them, are questions unanswerable at this point; but no one doubts that such devices could both hit and disable Soviet space-based systems. Would such a function be omitted? Would it be delayed at all after the postulated infrared warning?

How would the Soviets respond to these attacks?

4. Again, if a postulated (false) warning is enough to trigger expenditure of the XRLs in either or both of the above modes--the function of which is to "limit damage" to the U.S. and its forces from the supposed Soviet attack--would other "damage-limiting" systems be withheld? These would include other systems targeting Soviet space-spaced systems--Soviet Command, Control and Communications, intelligence and warning, and space-based defenses--ranging from ground- and air-launched ASATS, to various ground- and space-based directed-energy and kinetic energy systems.

But it would also mean the full preemptive launch of U.S. counterforce offensive systems against Soviet missile silos--to destroy Soviet missiles in their "pre-boost phase" while XRLs and other boost-phase interceptors were attacking missiles that had supposedly already been launched--and against Soviet ground-based C3I, along with subs in port and ground-based air- and ballistic-missile defenses.

There would not be precisely the same basis for time-urgency in launching these attacks as exists for boost-phase interceptors. In that sense, these "responses" would not have the same requirement for automation. But there would be urgency enough! Whether human participation or intervention in these attacks was removed or not, the pressure to initiate them as quickly as possible would be intense; and this would be foreseeable, in planning and preparation.

Indeed, given the first consideration above, not a great deal would be gained by waiting to see if the original warning signal (sufficient to launch XRLs) was a false alarm or not. The likelihood of Soviet pre-emptive response to the launch of the pop-up XRLs would seem great enough to motivate a full U.S. preemptive counterforce attack in any case. This is even more true if the pop-up XRL's target Soviet C3I satellites and space-based defenses, leading to the certain prospect of a ragged Soviet retaliatory response.

Thus, a decision to deploy a pop-up XRL (or other) boost-phase intercept system--which strictly implies a decision to automate its launch-on-warning--comes very close to being a decision to wire the entire U.S. preemptive forces into an automated launch-on-warning mode, with the all the implications for initiating World War III by non-human error that have long been recognized.